




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

Date: MAY 09 2012

From: Joan Tanaka, Chief 
Remedial Response Branch 1
Superfund Division

To: Amy Legare, Chair
National Remedy Review Board

Subject: National Remedy Review Board Exemption Request for U.S. Smelter and Lead Superfund Site (Operable Unit 1), East Chicago, Indiana

This memorandum serves to request an exemption from the National Remedy Review Board (NRRB) process for the U.S. Smelter and Lead Refinery, Inc. (USS Lead) Superfund Site's residential Operable Unit (OU1), located in East Chicago, Indiana. The anticipated remedy for OU1 is estimated to cost more than \$25 million and therefore qualifies for NRRB review. There is also a second operable unit at the site. OU2 is the USS Lead property at which there is a Resource Conservation and Recovery Act Corrective Action Management Unit which was completed in 2002. Some lead contamination remains in a wetland area of OU2, which will be evaluated during a separate remedial investigation/feasibility study (RI/FS) for that OU.

The Region is requesting this exemption because the anticipated remedy for OU1 involves simple yard excavations of lead-contaminated residential soils. The investigation and remedy evaluation process at OU1 follows the approach for residential soil cleanups described in the *Superfund Lead-Contaminated Residential Sites Handbook*, August 2003 (OSWER Directive 9285.7-50). The anticipated remedy for OU1 addresses the direct contact risks associated with lead-contaminated soils and follows the *Superfund Lead-Contaminated Residential Sites Handbook*; therefore, there are limited remedial alternatives for this OU.

EPA is currently conducting a fund-lead RI/FS at OU1. The FS evaluated a range of alternatives, as described in Attachment 1, including excavation and off-site disposal, and soil cover with institutional controls (ICs). The cost of the anticipated remedy for OU1 is driven by

the number of yards EPA anticipates will need to be cleaned up and not by other technical or policy issues.

The Region 5 Superfund Division Director supports this request for NRRB review exemption and supports Alternative 4A, Excavation of Soils Exceeding Remediation Action Levels, to a depth of two feet below ground surface, as EPA's proposed cleanup alternative.

The study area for OU1 of the USS Lead Site is approximately 322 acres in size, and includes 1,271 properties. The vast majority of those properties (1,174) are residential, though OU1 also includes a number of recreational, commercial, and industrial properties. Based on the representative sampling conducted during the RI, EPA believes that approximately 53% of the properties in the study area have lead contamination levels that require remediation. Since 2008, EPA has conducted time-critical removal actions at 29 residences based on the RI sampling showing lead concentrations exceeding 1,200 milligrams per kilogram (mg/kg). These actions involved removing the contaminated soil to a depth of 2 feet or until concentrations less than 400 mg/kg were achieved and disposing the material in an off-site landfill. These actions were consistent with the *Superfund Lead-Contaminated Residential Sites Handbook*. Additional site information is provided in Attachment 1.

If you have any questions, or require any additional information to support this exemption request, please contact the Remedial Project Manager, Michael Berkoff, at (312) 353-8983.

Attachment 1
Site Information in Support of NRRB Exemption Request

1. Site name

U.S. Smelter and Lead Refinery, Inc. (USS Lead) Superfund Site
OU1 – Residential Operable Unit
East Chicago, Indiana

See Figure 1-1¹ for the location of East Chicago and OU1 of the Site.

2. Media to be addressed, primary contaminants of concern, preliminary remediation goals

- a. **Media to be Addressed** – The remedy for OU1 addresses only the risks associated with direct contact with contaminated soil. Region 5 plans to investigate Site groundwater during the RI for OU2. This decision is based upon the following:
- i. lead contamination at OU1 is above the water table;
 - ii. the groundwater in the area is not a source of drinking water for the local community; and
 - iii. at OU2, there are contaminated materials in the wetlands.

The OU2 RI has not yet begun.

b. **Contaminants of concern** – Contaminants of concern (COCs) in soil at OU1 include inorganics, specifically lead and arsenic. Polyaromatic hydrocarbons (PAHs) were detected in soil samples but PAH contamination in OU1 does not appear to be site-related; rather, it seems to be indicative of a highly industrial urban residential area. For that reason, PAHs are not considered a COC for OU1.

c. **Preliminary remediation goals** – Acceptable risk-based preliminary remediation goals (PRGs) were calculated for each COC in each medium of concern for each pathway to be addressed within each exposure area. The PRG for lead is 400 ppm, the recommended residential cleanup goal from the *Superfund Lead-Contaminated Residential Sites Handbook*, August 2003 (OSWER Directive 9285.7-50). The PRG for arsenic is 26.4 ppm, the 95% upper threshold limit for site-specific background at OU1.

3. Scope and role of the operable unit or response action

- a. **Does this action hinge on previous actions?** No.

This will be the first and final remedial action for OU1, but not necessarily the final action for the Site as a whole, as EPA has not yet begun the RI/FS for OU2. Previous EPA

¹ Figures 1-1 and 1-3 are from the draft FS Report and were not renumbered for this exemption request.

actions at OU1 include removal and off-site disposal of contaminated soil down to two feet at 29 properties through time-critical removal actions. The remediated properties are shown in Figure 1-3. Additionally, contractors for the City of East Chicago have remediated one property, removing all the contaminated soil at the property and disposing of it off-site.

4. Risk summary

Human health risks

A human health risk assessment (HHRA) was conducted at the USS Lead Site during the RI for OU1. The HHRA evaluated the potential exposure of human receptors to constituents detected in environmental media at the site. The HHRA did not include lead in its calculations because the 2003 guidance sets the remediation goal at 400 mg/kg.

The 400 mg/kg Regional Screening Level (RSL) for lead was calculated using EPA's IEUBK model and default exposure assumptions. For the USS Lead Site, it was judged that insufficient site-specific information (for example, localized concentrations of lead in air, water, and foodstuffs) was available to warrant calculation of a site-specific residential soil Remediation Action Level (RAL). Therefore, residential properties with average lead concentrations in soil greater than 400 mg/kg were identified as presenting potential lead risks to residential receptors.

Risks were compared to EPA's risk range of 1×10^{-6} to 1×10^{-4} . Human health risks were evaluated for current and future land uses; future land uses incorporated deeper soil data on the assumption that landscaping work may bring deeper soils to the surface and increase the risk of exposure. In accordance with EPA guidance, risks within the risk range are remediated at the discretion of risk managers, while risks greater than 1×10^{-4} typically require remediation. Hazards are compared to a target hazard index (HI) of 1. Risks posed by lead in soil were evaluated by comparing lead exposure point concentrations (EPCs) in soil at each property to receptor-specific lead PRGs.

Residential Properties

Health risks at OU1 are driven primarily by soil lead concentrations in the future land use scenario. The *Superfund Lead-Contaminated Residential Sites Handbook* specifies that garden areas are to be excavated down to 24 inches or capped with 24 inches of clean fill material. Because there is uncertainty regarding where gardens may be located under the future land use scenario, risk discussions and removal strategies have been evaluated for the entire property down to 24 inches.

Under future land use, 35 percent of the properties tested had acceptable health risks (less than 1×10^{-6}), 45 percent of properties had unacceptable risks (greater than 1×10^{-4}), and the remainder (20 percent of properties) were within the risk range (1×10^{-6} to 1×10^{-4}). Based on a total number of 1,174 residential properties within the residential area (OU1),

EPA anticipates that 411 properties have acceptable risks, 528 have unacceptable risks, and 235 are within the risk range.

Non-carcinogenic hazards are driven primarily by arsenic with some additional risk associated with soil concentrations of antimony, manganese, and mercury. No cleanups will be conducted to address antimony, manganese, and mercury due to the low frequency of detections in soil for these constituents. Arsenic is discussed below.

Arsenic

Though lead was found to be the most widespread contaminant at OU1, arsenic was also present at some locations within the residential area. The maximum background soil concentration for arsenic at OU1 was measured at 14.1 mg/kg. Comparison of the EPA RSL for arsenic (0.39 mg/kg) to site-specific background concentrations indicates the presence of naturally occurring arsenic at the site above the EPA RSL. The Illinois EPA has calculated background metropolitan arsenic concentrations in soil to be 13.0 mg/kg. Although the USS Lead Site is not within Illinois, it is approximately 5 miles from the City of Chicago and the Illinois-Indiana state border. Use of the site-specific background level of 14.1 mg/kg was considered acceptable, based on the similarity between the metropolitan area background levels and those measured at OU1. Further arsenic data from soil samples collected within the OU1 area are distributed around both the site-specific background concentration of 14.1 mg/kg and the Illinois EPA metropolitan background concentration of 13.0 mg/kg. Because of the similarity between the soil concentrations for arsenic at OU1 and the background concentrations discussed above, it is appropriate to calculate an Upper Tolerance Limit (UTL) for arsenic concentrations in soil to distinguish between soil concentrations that are distributed among the naturally occurring values at the site and those that may be impacted by activities in and around the site. A 95% UTL, calculated using the log transformed data was determined to be 26.36 mg/kg. The 95% UTL value of 26 mg/kg was taken as the upper bound of the naturally occurring (i.e. background) arsenic concentrations in soil at OU1.

Ecological risks

No ecological habitats have been identified within OU1. A wetland area located within OU2 will be evaluated as part of the RI for that OU.

5. Remedial Action Objectives

The risks posed by OU1 are based on direct contact and ingestion of soil contaminated with lead and arsenic. The remedial action objective, therefore, is to prevent exposure to these COCs in impacted surface and subsurface soils through ingestion, direct contact, or inhalation, assuming reasonably anticipated future land-use scenarios.

The preliminary RAL for lead at OU1 is 400 mg/kg for residential areas and 800 mg/kg for industrial/commercial areas. The RAL is based on the *Superfund Lead-Contaminated*

Residential Sites Handbook, EPA RSLs, and the State of Indiana's *RISC² Technical Resource Guidance Document* for direct contact with soils.

The preliminary RAL for arsenic at OU1 is 26.4 mg/kg, based on the 95% UTL of the collected and analyzed arsenic data from the draft RI report.

6. Alternatives

The alternatives considered are consistent with the presumptive remedy guidance for residential lead cleanups. Based on the risks present at the site and the technologies available to address them, the following six alternatives were identified, evaluated, and ranked. The **bolded** alternatives passed the initial alternative screening and were evaluated against the NCP evaluation criteria.

Alternative 1 – No action. Total present worth = \$0.

Alternative 2 – Institutional controls.

Alternative 3 – On-site soil cover and institutional controls. Total present worth = \$30 million.

Alternative 4A – Excavation and off-site disposal of soil exceeding RALs to a depth of two feet below ground surface (bgs), with *ex-situ* treatment option. Total present worth = \$43.9 million.

Alternative 4B – Total excavation and off-site disposal of soil to native sand depth at yards which exceed RALs, with *ex-situ* treatment option. Total present worth = \$70.1 million.

Alternative 5 – *In-situ* treatment by chemical stabilization.

7. Tribal or State ARARs

The handling and disposal requirements for solid and hazardous waste are considered the ARARs for OU1. Indiana Rule 329 IAC 3.1 regulates the management of hazardous wastes. Rule 329 IAC 3.1-1-1 adopts the RCRA regulations of 40 CFR 260 through 40 CFR 270. The preferred remedy, Alternative 4A, would meet state ARARs for the handling of solid and hazardous waste. Given the range of lead concentrations at OU1, Region 5 expects to handle the majority of the material as solid waste; approximately 7 percent of the total yards sampled in the RI had lead at levels that would be considered characteristic hazardous waste.

² Risk Integrated System of Closure

8. Stakeholder views

a. PRPs –EPA is engaged in informal discussions with three potentially responsible parties (PRPs): Atlantic Richfield Company, a subsidiary of BP America, Inc. (ARC), E.I. du Pont de Nemours and Company (DuPont), and USS Lead Refinery, Inc (USS Lead). In April 2012, EPA advised ARCO, DuPont and USS Lead of its intention to seek an exemption from review by the National Remedy Review Board (NRRB). On April 23, 2012, each PRP responded, and all three letters are attached. ARCO and DuPont advised that each lacked sufficient information to determine whether a waiver was appropriate. USS Lead objected to the Region seeking an exemption from the NRRB. In addition to opposing EPA's request for an exemption from the NRRB process, USS Lead opposed EPA's efforts to list the Site on the National Priorities List in 2008. Neither ARCO, DuPont nor USS Lead has committed to do work at OU1.

b. Public – Region 5 has done extensive outreach in the local community since 2005. The principal message from the public is that they want a comprehensive cleanup of OU1 as soon as possible. For that reason, Region 5 believes that the public would support bypassing the NRRB process at OU1. The local community in the vicinity of the site does not have an organized group that represents their views, so Region 5 did not solicit a written position from the community.

c. City of East Chicago – Region 5 has had discussions with the City East Chicago on potential remedies for OU1 and explained that Region 5 will select a remedy that follows the *Superfund Lead-Contaminated Residential Sites Handbook* and is nationally consistent with similar sites. The City supports Region 5's request for the exemption from the NRRB process. The City's chief concern appears to be that EPA coordinates its cleanup activities with the City's redevelopment efforts and that remediation commence at the earliest possible time. The City's letter is attached.

c. State – The Indiana Department of Environmental Management (IDEM) supports Region 5's request for an exemption from the NRRB process. IDEM's letter is attached.

d. Congressional or community controversy

There is no controversy regarding the USS Lead Site.

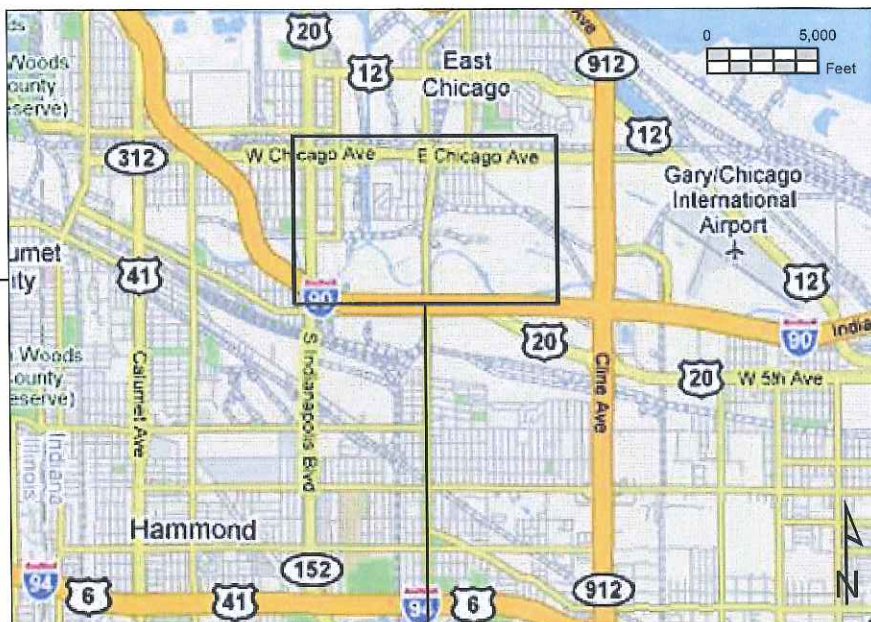
9. Decisions requiring headquarters coordination or consultation

a. Non-time critical removal actions over \$ 6M - N/A

b. Remedies for lead, radionuclides, PCBs, asbestos, mercury and dioxin - The remedy at OU1 is consistent with EPA's *Superfund Lead-Contaminated Residential Sites Handbook*.

10. Position of Regional Division Director on exemption request

The Region 5 Superfund Division Director supports this request for NRRB review exemption and supports Alternative 4A as EPA's proposed remedy alternative.



OU-1 boundary

Imagery sources (clockwise from upper left):
 ESRI Resource Center
 Google Maps
 ISDP (Indiana Spatial Data Portal)



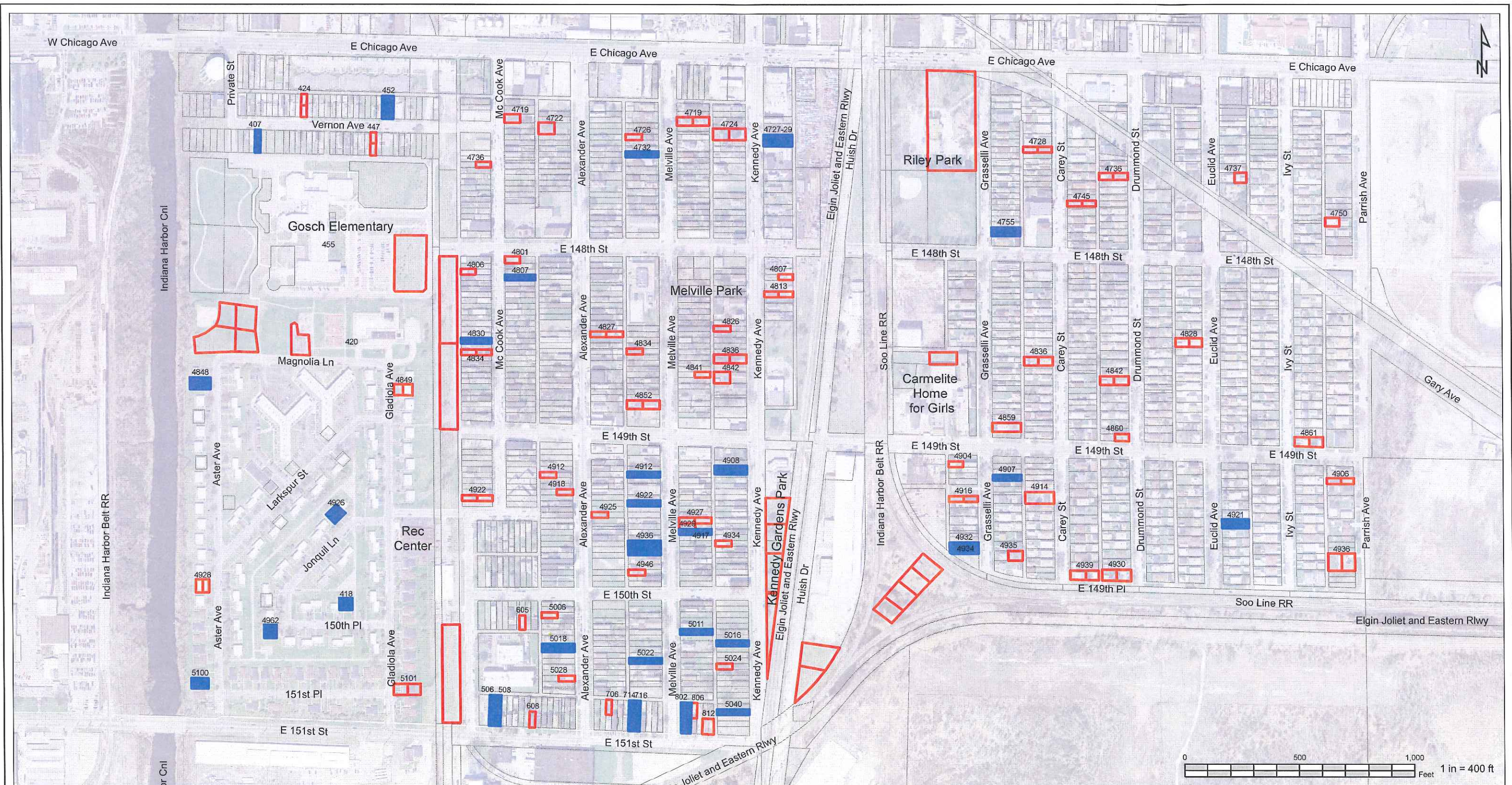
US SMELTER & LEAD REFINERY
 LAKE COUNTY, EAST CHICAGO, INDIANA

DRAFT FEASIBILITY STUDY

FIGURE 1-1 **USS LEAD RESIDENTIAL AREA** **SITE LOCATION MAP**

EPA REGION 5 RAC 2 | REVISION 0 | NOVEMBER 2011

ST SulTRAC



- Lead > 400 mg/kg
- Remediated properties

Notes:

1. The property number represented on the sampled property is the legal address of the property.
2. Results are presented on a yard basis, which includes front yard, back yard, and recreational quadrants.
3. All samples exceeded the analytical detection limit.

mg/kg - Milligram per kilogram

Imagery sources:
ISDP (Indiana Spatial Data Portal)



US SMELTER & LEAD REFINERY
LAKE COUNTY, EAST CHICAGO, INDIANA

FIGURE 1-3

EPA REGION 5 RAC 2 | REVISION 0 | APRIL 2012

ST SuITRAC

Letters from PRPs



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April 23, 2012

Steven P. Kaiser
Office of Regional Counsel
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604

Re: USS Lead Superfund Site, East Chicago, Indiana

Dear Mr. Kaiser:

I am writing in response to your letter of April 16, 2012 concerning the USS Lead Superfund Site (the Site). Atlantic Richfield Company, a subsidiary of BP America, Inc. (ARC) appreciates the U.S. Environmental Protection Agency's (EPA) offering ARC an opportunity to comment on the appropriateness of EPA's seeking an exemption from review by the National Remedy Review Board (the Board).

ARC has not been provided with all of the testing, analysis, studies or reviews of the response options and considerations that will be included in the RI/FS and will otherwise provide the basis for a proposed plan and the selection of a final remedy. ARC is aware that the EPA has considered a range of response options at numerous sites across the country where lead and arsenic concerns have been identified. ARC recognizes that the identification of a proposed plan and selection of a final Site remedy requires a deliberative approach to reviewing all of the available and relevant information and considerations. Thus ARC assumes that the proposed plan currently favored by the Region is more detailed and addresses response options in more depth than is set out in the letter of April 16, 2012. Therefore, it would be premature at this time for ARC to take a final position as to the Region's current intention to seek from the Board an exemption from review. ARC reserves the right to request review by the Board at a subsequent time if ARC believes that the proposed plan is not consistent with the EPA initiative to promote consistent and cost effective Superfund cleanup decisions.

This response may not be interpreted as an admission of liability or responsibility of ARC with respect to the Site under Superfund or any applicable law or claim. ARC specifically reserves all legal rights and defenses with respect to any matter related to the Site.



Steven P. Kaiser
April 23, 2012
Page Two

ARC requests copies of, and the opportunity to review, the testing, analysis and any considerations relating to the EPA's evaluation of the Site, the proposed plan under consideration and the EPA's proposal to seek from the Board an exemption from review. ARC also requests an opportunity to meet with the EPA to discuss these issues. Please do not hesitate to contact us concerning this or any other matter.

Regards,

DLA Piper LLP (US)

A handwritten signature in blue ink, appearing to read 'Michael H. Elam', with a long horizontal flourish extending to the right.

Michael H. Elam
Partner

Admitted to practice in Illinois and Indiana

MHE/ly

cc: Michael Berkoff
Doug Reinhart

EAST48380208.3



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April 23, 2012

Steven P. Kaiser, Esq.
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: USS Lead Superfund Site, East Chicago, Indiana (the Site)

Dear Mr Kaiser,

DuPont received your letter of April 16 indicating EPA Region 5 is finalizing studies for the USS Lead Site, and currently favors a plan to excavate impacted soils at the Site and dispose of them off-site. The Region remedy cost estimate is \$43.9 million. Although that exceeds the \$25 million threshold for review by the EPA National Remedy Review Board, the Region intends to seek an exemption from such review. The letter provides DuPont an opportunity to comment upon the Region's proposal to seek an exemption. By email of April 20 you have asked for a response by April 23.

Because we have not seen the EPA studies, we are unable to comment upon whether or not review by the Board would be helpful. We plan to review the Remedial Investigation, Feasibility Study and Proposed Plan when they issue, and will comment as appropriate. We reserve the right to request a review by the Board at that time if we believe the Proposed Plan is not consistent with the Superfund law, regulations, policy, practices and guidance.

This response may not be interpreted as an admission of liability or responsibility of DuPont for conditions at the Site under Superfund or any other laws.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bernard J. Reilly", written over the typed name.
Bernard J. Reilly

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April 23, 2012

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VIA E-MAIL

Steven P. Kaiser
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: *USS Lead Superfund Site, East Chicago, Indiana*

Dear Mr. Kaiser:

On behalf of USS Lead Refinery, Inc. ("USS Lead"), we write regarding your letter dated April 17, 2012, concerning the Region's intention to seek an exemption from review by the National Remedy Review Board ("NRRB").

Your letter was received at the close of the business day, April 17, 2012. In your letter, EPA Region 5 requests that USS Lead provide any responsive comments by close of business, April 20, 2012. Region 5 subsequently extended that deadline until close of business, April 23, 2012. Thus, this response is timely. Please note that by submitting this response, USS Lead does not admit to any responsibility or liability.

We appreciate the opportunity to address Region 5's intended action to seek an exemption from the NRRB and that it is standing EPA policy to provide PRPs (as well as communities) an opportunity to comment on exemption requests: "Regions should offer states, tribes, local governments, PRPs and local communities an opportunity to summarize in writing their opinion regarding the proposed exemption decision." <http://www.epa.gov/superfund/programs/nrrb/faqs.htm#4> However, in this instance, Region 5 has not provided a meaningful opportunity to comment because it has not made available data (1) supporting the proposed remedy, (2) the basis for the exemption request, and (3) even what are the actual terms of the proposed remedy. Therefore, USS Lead requests that Region 5 defer any decision to seek an exemption until it provides interested parties with additional information and provides those parties with sufficient time to review and comment on said information. In the event that Region 5 is unwilling to defer seeking an exemption from the NRRB until after providing interested parties with information about the proposed remedy and providing the parties with sufficient time to provide comments thereon, then USS Lead opposes seeking an exemption and requests that the proposed remedy be reviewed by the NRRB.

Chicago Cincinnati Cleveland Columbus Costa Mesa
Denver Houston Los Angeles New York Orlando Washington, DC
601247175

The case law is clear that opportunity to comment without the basic underlying data upon which the proposed agency decision is based is illusory. U.S. v. Nova Scotia Food Products Corp., 568 F.2d 240 (2d Cir. 1977) ("To suppress meaningful comment by failure to disclose the basic data relied upon is akin to rejecting comment altogether."). USS Lead respectfully submits that Region 5 has not complied with the agency's policy quoted above, and reserves the right to submit further comments on the exemption request if and when the basic data underlying the requested exemption is made available to the Company.

The purpose of the NRRB is to promote cost-effective solutions and ensure regional consistency. OSRTI management has reiterated that more, not fewer, proposed remedies should be reviewed by the NRRB. Memorandum from Michael Cook to Superfund National Policy Manager, March 21, 2005. The estimated costs for the proposed USS Lead remedy are almost twice the target level in the 2005 Cook memo.

It must be noted that the Remedial Investigation and Feasibility Study ("RI/FS") referenced in your letter has not been made available to the public. Consequently, USS Lead (or, presumably, no other interested party) has any information on how Region 5 determined the proposed remedial action levels for the USS Lead site, including whether Region 5 performed a risk assessment as part of that determination. Your letter indicates that the proposed remedy constitutes excavation of soils that contain concentrations of lead in excess of 400 ppm. However, the EPA guidance provides that the 400 ppm criterion is a soils screening level for lead, not a cleanup level. Hence, confirmation of lead in soil in excess of 400 ppm requires further investigation, likely including a risk assessment, to develop a risk-based remedial action level that often results in the establishment of a cleanup level less stringent than the screening level of 400 ppm. That is, the 400 ppm should not be used as a "default" remedial action level. The appropriate remedy depends on a variety of factors, as described in the attached technical report prepared by Exponent entitled "Technical Considerations for Remediating Lead-Contaminated Soils".

The presence of arsenic can be attributable to many common sources such as pesticides or herbicides which may have been applied to the residential yards; however, Region 5 has not provided any information indicating whether it has determined the sources for the lead and arsenic. In addition, it isn't clear why Region 5 is proposing a remedial action level for arsenic since the remedy to achieve a performance standard for lead should address the presence of arsenic. The failure to provide additional information to address these issues and the lack of any opportunity for a meaningful public review process underscores why seeking an exemption from NRRB is premature.

Lastly, the limited information that is available demonstrates that Region 5 does not satisfy the criteria to secure an exemption from NRRB review. The EPA guidance on when an exemption from NRRB review is appropriate indicates that this type of exemption is appropriate for "certain remedies such as simple landfills or yard excavations."¹ The brief description in your letter of the plan Region 5 currently favors for the USS Lead site – including the

¹ CSTAG and NRRB Operational Changes (revised October 28, 2011), available at http://www.epa.gov/oswer/docs/ici/cstag_nrr_operational_changes.pdf.

Steven P. Kaiser
April 23, 2012
Page 3

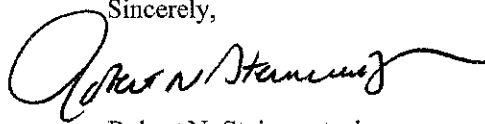
excavation, backfilling, grading, seeding, and watering of 680 properties at an estimated cost of \$44 million – indicates that Region 5 is considering a remedy that far exceeds the scope and magnitude of the “simple...yard excavations” contemplated by the EPA as appropriate for exemption from NRRB review. Moreover, as outlined in the attached technical appendix, there are many discretionary decisions about how to apply EPA guidance at lead sites, and thus the remedies adopted by various regions have varied widely. The proposal for the USS Lead site, therefore, represents the type of high cost remedy that should be reviewed by the NRRB.

The only justification provided in Region 5’s April 17 letter for seeking an exemption is that the remedy is “consistent with the procedures outlined in Superfund Lead Contaminated Sites Residential Handbook (August 2003).” But there are many other remedies that would be consistent with this guidance, and in accordance with its mandate, the NRRB should review the Region exercise of discretion to determine if it is cost-effective and consistent with actions by other Regions. Based on the very limited information provided, it does not appear to be either.

In sum, Region 5 has not provided USS Lead with sufficient information or adequate time to provide the agency with substantive comments on the proposal to seek an exemption from review by the NRRB. In the absence of providing this information, Region 5 should defer any action to seek an exemption from the Board. Deferral is appropriate given the magnitude and scope of the proposed remedy, and the limited public funds available to conduct such an expensive remedy. Providing the information supporting the proposed remedy will allow interested parties to assess whether the proposed remedy is technically justifiable, legally defensible, and constitutes an appropriate use of Superfund monies. In the event Region 5 elects to proceed forward with the proposed exemption notwithstanding these demonstrated deficiencies, then USS Lead opposes seeking an exemption.

Please contact the undersigned if you wish to discuss these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert N. Steinwurtzel", with a stylized, flowing script.

Robert N. Steinwurtzel

Attachment

cc: Norm Johnson, USS Lead Refinery, Inc.



EXTERNAL MEMORANDUM

TO: Robert Steinwurtzel, Counsel representing USS Lead
FROM: Charles Menzie, Ph.D. *Charles A. Menzie*
DATE: April 20, 2012
PROJECT: USS Lead Site
SUBJECT: Technical Considerations for Remediating Lead-Contaminated Soils

On behalf of USS Lead Refinery Inc. (USS Lead), Exponent was asked to review the April 17, 2012, letter from Steven Kaiser of EPA Region 5 (EPA letter) to Robert Steinwurtzel, counsel representing USS Lead. The EPA letter indicates that Region V currently favors a plan that calls for the excavation and offsite disposal of soils from, properties that contain concentrations of lead in excess of 400 ppm or arsenic of 26.4 ppm within the top 2 ft. No information is provided regarding the procedure to stepping out sampling from hot spots, or whether the proposal is to remediate an entire lot if a single sample exceeds 400 ppm. Excavated areas will be backfilled with clean soil, graded, seeded, and watered. EPA estimates that work will be required at 680 properties and that the project cost will be approximately \$43.9 million. EPA considers the planned remedial approach to be "simple and straightforward" and consistent with the *Superfund Lead-Contaminated Residential Sites Handbook* (U.S. EPA 2003) (Residential Lead Handbook). The handbook was designed to provide consistency across regions for addressing lead contamination issues for Superfund sites at which residential properties have elevated levels of lead.

The Residential Lead Handbook when applied to a large site with numerous properties is not "straightforward and simple" and requires great attention to detail and process. However, based on the premise that remediation of a large lead site with an estimated cost of almost \$44 million dollars is "simple and straightforward," EPA Region 5 intends to request a waiver from review of the remedial plan by the National Remedy Review Board (the Board). In this memorandum, we comment on several aspects of applying the Residential Lead Handbook to residential properties and why we think the remedy proposed by EPA Region 5 should be reviewed by the Board. We also draw upon experience with lead remediation at other superfund sites around the country. Our comments address:

- Land-use considerations
- The contention that the Residential Lead Handbook is easily applied and straightforward
- Reliability of sampling strategies and statistical analyses
- Consideration of the appropriate soil-lead target clean-up level

Technical Considerations for Remediating Lead-Contaminated Soils

- Consideration of bioavailability
- Consideration of soil depth for remediation
- Consideration of alternative remedial options.

Land-Use Considerations

The Residential Lead Handbook is intended to be applied to residential properties as defined within the handbook. It is unclear from the letter whether EPA Region 5 has distinguished among the various types of land use included in the 680 properties. The proper application of guidance to properties is a factor that the Board should consider in reviewing the proposed remedial plan.

Even for residential properties, the Residential Lead Handbook does not treat all of these properties the same. Differences among groups of properties will involve different types of risk assessment and risk management decisions. The Residential Lead Handbook suggests a tiered approach, and this requires necessary technical and analytical information, along with professional judgment. The handbook also recognizes that different remedial approaches may be warranted depending on the presence or absence of sensitive populations (primarily very young children). These types of judgments can be very important and fall into the purview of the Board to review with respect to their appropriateness.

Importantly, Superfund does not specify a simple soil value, such as 400 ppm, for clean-up actions at lead-contaminated sites. Instead, the Residential Lead Handbook calls using the IEUBK model as the means for assessing risks and guiding remediation. Use of this model allows the assessors and managers to incorporate site-specific information, including information on bioavailability where that makes sense. The 400-ppm number is generally considered to be a residential screening level.

The Contention that the Residential Lead Handbook is Easily Applied and Straightforward

EPA Region 5 suggests that the Board need not review the \$43.9 million proposed remedy, because the approach to assessment is simple and straightforward. The purpose of the Residential Lead Handbook was not to establish a simplified approach; rather, it developed to help ensure consistency among regions. To that end, the Residential Lead Handbook provides considerable detail on sampling, analysis, and evaluation procedures. Left open are the types of judgments that assessors must make, as well as the manner in which data are to be used to inform decisions. A portion of the process is captured in complex flow charts that are included in Attachment A of the memorandum. These do not reveal a “simple” process but instead indicate that important technical policy decisions must be made throughout the process. These

Technical Considerations for Remediating Lead-Contaminated Soils are the types of decisions that can have large implications in regard to the cost-effectiveness of the remedy. For large remediation projects, such as the \$43.9 million proposed remedy, the discretionary elements of the proposed remedy by EPA Region 5 for the USS Lead Site warrants careful review by the Board. If the starting assumptions concerning what constitutes a health protective remediation are flawed (i.e., need of a yard-wide target of 2 feet of soil excavation and cover) or steps have not been carefully followed or have been "skipped" in the interest of simplification, the resulting remedy could be a misdirected remedial program that is not cost-effective.

The Residential Lead Handbook also includes some disclaimers and precautionary statements that should be considered:

Some of the statutory provisions described in this document contain legally binding requirements. However, this document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it cannot impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances. Any decisions regarding a particular remedy selection will be made based on the statute and regulations, and EPA decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate.

Interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation, and the Agency welcomes public input on this document at any time. EPA may change this guidance in the future.

Reliability of Sampling Strategies and Statistical Analyses

Sampling strategy and statistical analyses of data are among the most important aspects of evaluating lead exposures. The Residential Lead Handbook provides the detail on how this should be accomplished. Of particular import is the concept of estimating **the average exposure**. This average is not the same as a isolated soil sample with lead above a certain number (e.g., 400 or 1,200 mg/kg). Instead, it needs to be derived through appropriate stratified and composite sampling. Unfortunately, Region V has provided no details regarding its proposed sampling procedures. If that sampling is not executed properly, the rest of the risk assessment will be incorrect, and risk management decisions may not be appropriate. Because of the importance of sampling strategy, statistical analysis, and exposure estimates, it is important for the Board to examine the reliability of the approach taken by EPA Region 5. The reliability

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and cost-effectiveness of the remedy will depend on the reliability of the underlying sampling program.

To illustrate the importance of proper sampling, consider the following from the Residential Lead Handbook. The handbook recommends that, when sampling residential lots with a total surface area less than 5,000 square feet (a typical urban lot size), five-point composite samples should be collected, at a minimum, from each of the following locations: the front yard, the back yard, and the side yard (if the size of the latter is substantial). The composites from the front, back, and side (if needed) yards should be equally spaced within the respective portion of the yard, and should be outside of the drip zone and away from influences of any other painted surfaces. Composites should consist of aliquots collected from the same depth interval. For residential lots with a total surface area greater than 5,000 square feet, the Residential Lead Handbook recommends that the property be divided into four quadrants of roughly equal surface area. The two quadrants in the front yard should encompass one-half of the side yard; likewise for the two quadrants in the back yard. One five-point composite of aliquots collected at equal spacing and from the same depth interval should be obtained from each quadrant. Each aliquot should be collected away from influences of the drip zone and any other painted surfaces. The stratification and averaging recommended by the Residential Lead Handbook is key to risk assessment and risk management, and is an important technical aspect of the remedy that the Board should review. **It is essential that the sampling be capable of supporting estimates of the average exposures for particular areas, and that single sampling points not be used for judging exposure.**

Based on our experience with lead-contaminated properties, the stratified approach described in the Residential Lead Handbook is the norm. A stratified approach allows for a more focused identification of areas that warrant remediation.

Consideration of the appropriate soil-lead target clean-up level

Within the Residential Lead Handbook it states...

In summary, there is no national clean-up standard for lead in residential soil on a Superfund site; however, there is a consistent process by which residential soil lead clean-up levels are selected. One step is to gather site-specific data as recommended in Section 4 of this Handbook and review other guidance on the use of the IEUBK Model (EPA, 1994b; TRW web site: <http://www.epa.gov/superfund/programs/lead/ieubk.htm>).

Our experience at lead-contaminated Superfund sites is that the IEUBK model is used when sites are large and when there is the potential for exposure of young children. While 400 ppm serves as a useful screening level, site-specific conditions may lead to other target values.

Being that there is no national clean-up standard for lead in residential soil on a Superfund site, it would be inaccurate to assume that a clean-up level of 400 mg/kg is a bright line that needs to

Technical Considerations for Remediating Lead-Contaminated Soils

be achieved to be health protective in all cases. If Region V is indeed taking that position at this site (as appears to be the case from Mr Kaiser's brief letter), there could be important implications for regional consistency elsewhere that the Board should consider. As highlighted above only when proposed clean-up levels are outside the range of 400- 1200 mg/kg, is special review needed. In essence, this indicates that soil-lead levels upwards of 1,200 mg/kg can be considered health protective depending upon yard specific considerations. For these reasons, it would be appropriate to revisit the target clean-up value of 400 mg/kg proposed by EPA in their letter.

Consideration of Bioavailability

Explicit consideration of bioavailability becomes especially important when sites are large and involve many properties. The potential for community-wide exposures is the reason why EPA developed a means for assessing site-specific bioavailability. Lead and arsenic are two metals for which EPA, at a national level, has developed approaches for assessing bioavailability. This important consideration influences exposure and can lead to remedial outcomes that differ from the selection of off-the-shelf clean-up values. At sites where bioavailability is reduced, lead target levels can be considerably higher than the 400 ppm screening level. In particular, areas that are used for recreational purposes in communities may be handled very differently than residential yards.

Lead in soil is known to vary considerably in bioavailability. In 2007, EPA published a report of the relative oral bioavailability (RBA) of lead in soils for 19 soils from 10 contaminated sites. The RBA values in this report ranged from 6% to 90%, and included several (seven or more) soils impacted by smelter waste. Other studies indicate similar considerations for arsenic including an RBA of 18% that was applied to soils impacted by the smelter in Anaconda, Montana. The body of information regarding the bioavailability of lead and arsenic illustrates that several site- and source-specific factors can have a significant effect on the potential for exposures (human or ecological) from contaminated soils, and that ignoring these factors can result in inaccurate assessment of potential exposures and risks. In a memorandum to Superfund policy managers, James Woolford, then Director of the Office of Superfund Remediation and Technology Innovation, instructed that "Bioavailability can be a critical factor in determining the potential uptake of contaminants by receptors and an important consideration in determining potential threats to human health that may be posed by contaminated sites (Woolford 2007). Additionally, it's important to point out that assessing the RBA of lead from soils is simple to accomplish, now that EPA has issued national guidance and an analytical method for generating data (U.S. EPA 2007).

The Residential Lead Handbook allows for the consideration of site-specific evaluation of bioavailability, but it is unclear whether EPA Region 5 completed such an evaluation. Instead,

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the letter from EPA implies that the 400-mg/kg screening value for residential soils was simply selected as the clean-up value for all soils.

The information on site-specific bioavailability is incorporated into EPA's IEUBK model as an input value. The Residential Lead Handbook indicates that such model inputs should be changed only when defensible, site-specific information that is specifically applicable to the parameters is collected. Moreover, these changes should also ensure that model outputs are protective of future residents. Examples of such information are dust lead concentration, drinking-water concentration, bioavailability data (e.g., *in vivo* pig studies), and soil-to-dust ratio. The predictive capacity of the IEUBK model depends on the representativeness of the inputs. The Residential Lead Handbook provides further guidance on how this aspect of the exposure assessment should be conducted.

Consideration of Soil Depth for Remediation

Soil depth is a key factor for risk assessment and for remediation. The Letter from EPA Region 5 implies that all soils on any property with a single "hit" above 400 ppm will be remediated to a depth of 24 inches. Based on experience with other lead-contaminated sites, this is a deeper remediation depth than what is typically selected to address soil exposures when the source of lead contamination is at the surface. A two-foot deep remediation of yards with subsequent backfill is likely at variance with guidance provided in the Residential Lead Handbook. Lead-contaminated sites with which we have experience have involved remediation methods that are specific to the contaminated soil depth interval. In many cases, this can be very shallow. Because a two-foot excavation with backfill would be considerably more expensive than standard approaches used for lead sites, this is an aspect of the proposed remedial plan that should be reviewed by the Board for cost effectiveness. Moreover, two-foot excavation depth would greatly increase the volume of soils to be disposed off-site, particularly if the Region intends to dispose of all soils as hazardous waste based on a single reading above 400 ppm. Again, insufficient detail is provided in the Kaiser letter, but the implications for regional consistency could be very substantial if the Board signs off on this approach as non-controversial, and indeed required by the Handbook, as Region V apparently maintains.

We examine the issue of soil depth in two parts. First, we discuss sampling of soils and estimates of exposure for risk assessment purposes. Second, we discuss implications for risk management.

The Residential Lead Handbook offers the following considerations for sampling of soils with respect to soil depth and data utilization:

- Composite samples should be collected at 6-inch depth intervals (i.e., 0–6 inches, 6–12 inches, 12–18 inches, and 18–24 inches).

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- Five-point composite surface soil samples should be collected from 0 to 1 inch for human health risk assessment purposes (U.S. EPA1989, 1996c).
- The focus on near-surface sampling is important at smelter sites, because the 0–1 inch horizon may be far more contaminated than the 1–6 inch. This is due to the atmospheric depositional nature of the lead source, and it highlights the importance of shallow rather than deep soils at such sites.

The Residential Lead Handbook indicates that collection of samples from specified depth intervals serves two primary purposes: risk assessment and remedial decision making.

The vertical extent of lead (or arsenic) contamination at the USS Lead Site is a critical aspect of remedial design. The Letter from EPA suggests that 24 inches is the depth to which remediation is planned. However, as indicated above, lead contamination that arrives from an atmospheric source is found largely in the most surface soil levels (i.e., the upper few inches). Removing soils to 24 inches appears to be inconsistent with prevailing guidance and practice, unless these deeper layers are in fact contaminated to levels that exceed risk-based concerns. As indicated in the Residential Lead Handbook, and based on experience elsewhere, it is more common to remediate the upper layers that exhibit contamination. Commonly, soil remediation depths for surface soil contamination can extend to 12 inches of soil depth and this is the case for a number of superfund sites around the country. In addition to excavation to depth, clean soil should be used to establish an adequate barrier from contaminated soil in a residential yard, for the protection of human health. In accordance with the Residential Lead Handbook, cover soil can either be placed after excavation as backfill or placed on top of the contaminated yard soil. The rationale for establishing a minimum cover thickness of 12 inches is that the top 12 inches of soil in a residential yard can be considered to be available for direct human contact. The Residential Lead Handbook notes that, with the exception of gardening, the typical activities of children and adults on residential properties do not extend below a 12-inch depth. Thus, placement of a barrier of at least 12 inches of clean soil will generally prevent direct human contact with and exposure to contaminated soil left at depth.

Consideration of Alternative Remedial Options

It is unclear from the EPA letter that alternatives other than excavation of soil and back-filling were considered. As noted above, covering contaminated areas with clean soil can be a cost-effective remedy. In addition, presuming most of the site-related lead reflects atmospheric deposition, it is expected that most contamination for this metal would be at the surface (i.e., well within the top few inches of soil). For this reason, it is presumptuous to assume that excavation of 24 in of soil is required to provide a health protective remedy. Rather a 12" soil cover should be considered, as it will be health protective for the majority of areas requiring remedial action.

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April 20, 2012

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Excavation and backfilling with a cover are not the only ways to address exposures in lead-contaminated soils. There has been continued demonstration and project work involving amending the soil with phosphorus or high iron biosolids composts. A project is currently underway in the South Prescott community of Oakland, California. The remediation with mineral amendments is being carried out adjacent to a superfund site. The use of amendments can be especially attractive for areas where there is a desire to reduce exposure to lead in a cost-effective manner that is not disruptive to the community

References

U.S. EPA. 2007. Guidance for evaluating the oral bioavailability of metals in soils for use in human health risk assessment. OSWER 9285.7-80. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 2003. Superfund lead-contaminated residential sites handbook. OSWER 9285.7-50. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

Woolford, J.E. 2007. Guidance for evaluating the oral bioavailability of metals in soils for use in human health risk assessment. Memo to Superfund National Policy Managers, Regions 1-10, Regional Toxics Integration Coordinators (RTICS), Regions 1-10. OSWER 9285.7-80. U.S. Environmental Protection Agency, Washington, DC.

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ATTACHMENT A

**FIGURES ILLUSTRATING THE ASSESSMENT AND REMEDIAL PROCESS FOR
LEAD-CONTAMINATED SOILS**

FROM U.S. EPA (2003)

**Note: The process is intended to provide consistency. However, that does not make this
process either “simple” or “straightforward.”**

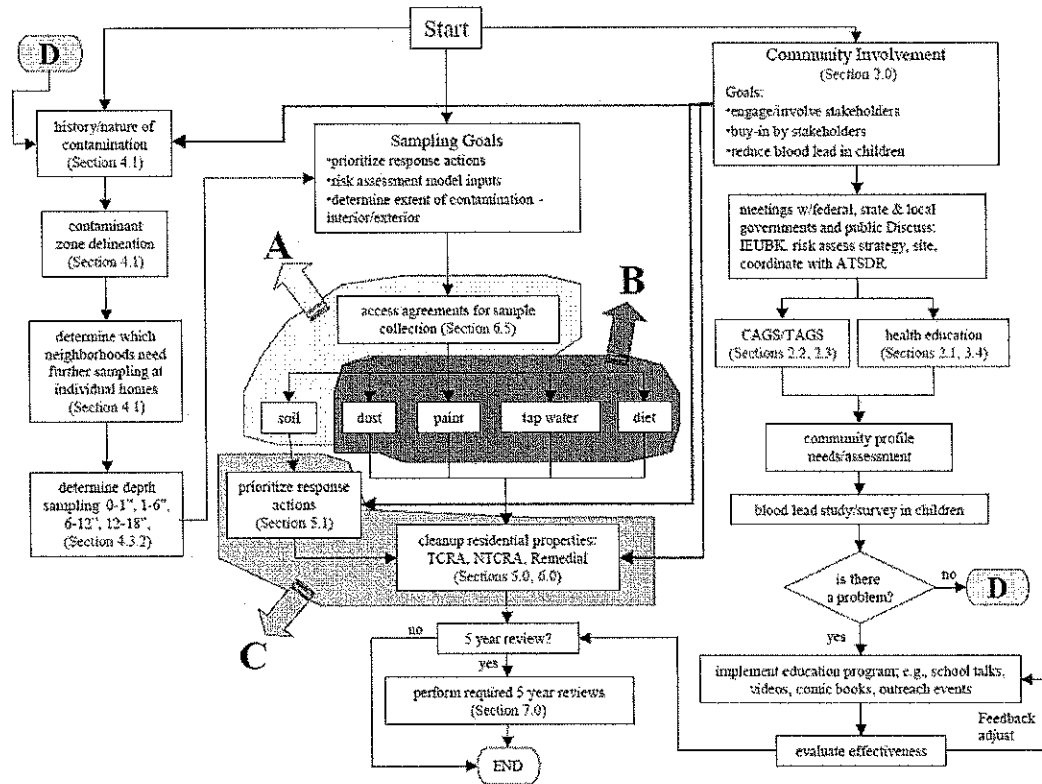
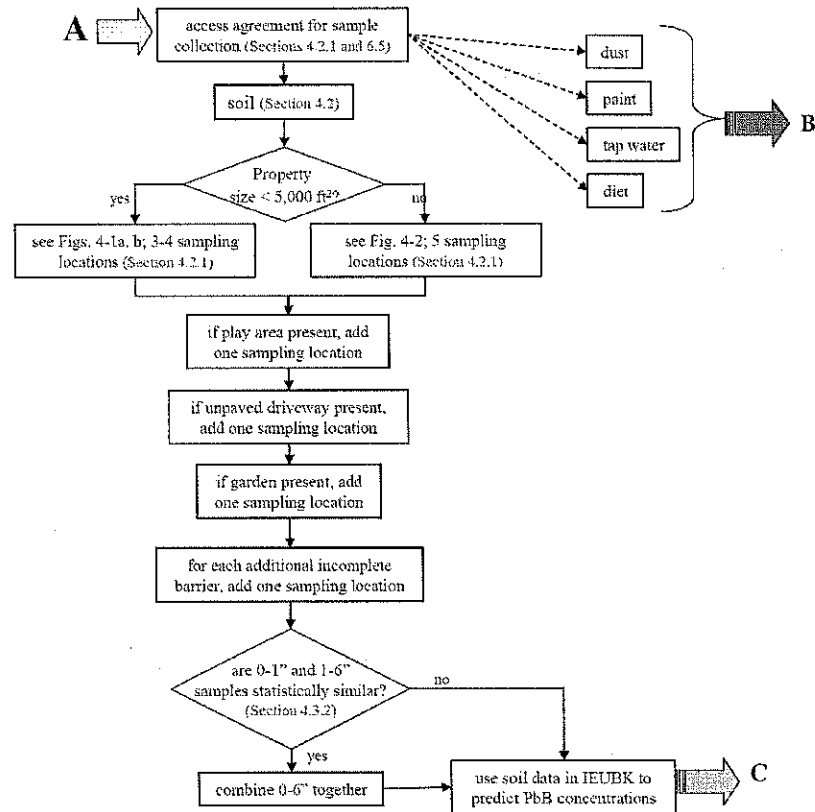
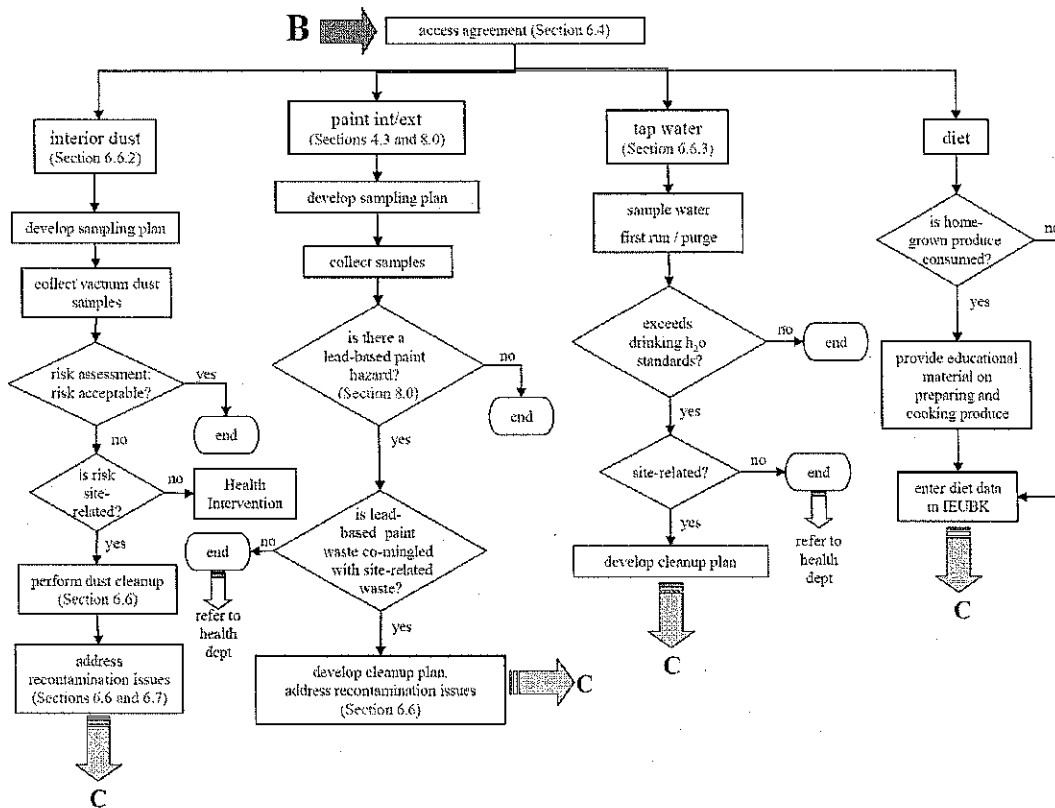


Figure 5-1. Recommended clean-up process for lead-contaminated residential sites. Refer to Figure 1-1 for an overview of the process. The shaded portions of the figure, labeled A-C, are expanded on the second through the fourth pages of the flowchart.

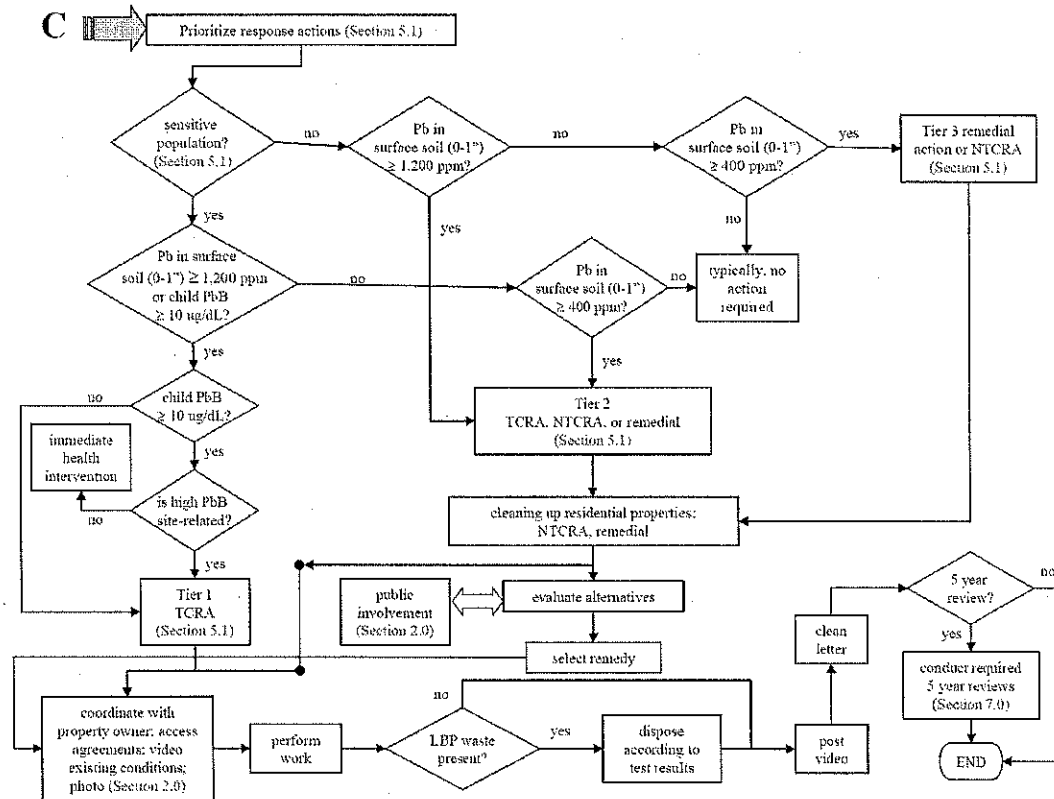
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Letter from City

Anthony Copeland
MAYOR



City of East Chicago
4527 INDIANAPOLIS BLVD.
EAST CHICAGO, INDIANA 46312
219-391-8200 • 219-391-8397 FAX

March 9, 2012

Michael Berkoff
EPA
77 West Jackson Blvd.
Chicago, Illinois 60604-3590

Subject: Exemption Support of the NRRB Review Process

Dear Mr. Berkoff:

As you are aware, I sent you a letter dated, February 15, 2012, declining your request to petition for a review exemption to the National Remedy Review Board (NRRB). At that time, we felt it was the proper course of action. However, based on EPA input and assurances from our March 8, 2012, meeting, you convinced us that it is in the best interest of the City of East Chicago to support the exemption request.

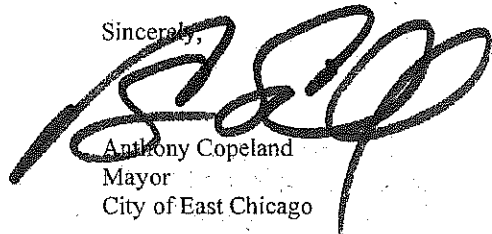
We support your recommendation of an exemption request from the NRRB review based on the following:

- EPA has assured the City that there are no other viable remediation technologies available that will effectively remediate the contaminated soil other than excavate, remove, and replace with clean fill, which is the current EPA proposed clean-up strategy.
- Per your explanation, the NRRB review process can take several months to complete; therefore, forgoing the review process will expedite the remediation of the site. The removal of the environmental and health hazard as soon as possible is very important to the City.
- The exemption will not adversely impact the City's ability to provide future input and coordination efforts with the EPA on this project.
- You have assured the City, regardless of an exemption, that EPA will evaluate and pursue viable cost effective remediation techniques and bidding strategies that may include demolition of dilapidated and abandoned homes.

The City supports EPA's goal to remediate the site quickly, safely, and cost effectively, with the added goal that the final remediated site will meet the City's objective to optimize the land use for the City's future. We look forward to working with the EPA in a spirit of cooperation to align our goals as best as possible.

Thank you for meeting with me and my team.

Sincerely,



Anthony Copeland
Mayor
City of East Chicago

Letter from State



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

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Indianapolis, Indiana 46204
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February 3, 2012

Mr. Michael Berkoff
U.S. EPA, Region V
Mail Code: SRF-6J
77 West Jackson Blvd.
Chicago, Illinois 60604-3507

Dear Mr. Berkoff:

Re: Remedy Review Board Exemption
USS Lead Superfund Site
East Chicago, Indiana

It is the Indiana Department of Environmental Management's (IDEM) understanding that as the U.S. EPA Remedial Project Manager for the USS Lead Superfund Site in East Chicago, Indiana, you are in the process of applying for an exemption from the remedy review process to the EPA's National Remedy Review Board. The purpose of this letter is to offer the support of IDEM for your exemption request.

The USS Lead Site is currently an EPA lead, fund-lead Superfund site. As the support agency, IDEM staff have recently reviewed the draft Feasibility Study Report prepared for this site and have expressed our support for the selection of Alternative 4A as the preferred remedial action alternative, which involves the excavation of soils exceeding Remedial Action Levels to a depth of two feet below the ground surface. We believe this alternative provides the best balance between overall protection of human health and the environment and remedial action costs. Further, due to the nature of the site, which consists primarily of small residential properties that lend themselves to relatively few viable remedial technologies, the cost of the site remedy will likely be driven by the number of yards requiring remediation, rather than by the remedial technology employed at the site.

Thank you for the opportunity to provide our thoughts on your exemption request. If you have any questions regarding this matter, please contact Mr. Douglas Petroff, IDEM project manager for this site, at (317) 234-7179.

Sincerely,

Bruce H Palin
Assistant Commissioner
Office of Land Quality

BP:js
cc: Rex Osborn, IDEM
Douglas Petroff, IDEM